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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
APICELLA, KARIE O	

ART UNIT	PAPER NUMBER
1795	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/731,168	THATE ET AL.	
	Examiner	Art Unit	
	Karie O'Neill Apicella	1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 April 2010*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. The Applicant's amendment filed on April 22, 2010, was received. None of the claims have been amended or cancelled. Therefore, Claims 1 and 3-13 are pending in this office action.

2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action issued on January 22, 2010.

Claim Objections

3. The objection to Claim 3 because of the following informalities is maintained: Claim 3 is dependent from Claim 2, which has been cancelled. For purposes of compact prosecution, Examiner is treating Claim 3 as being dependent from Claim 1. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The rejection of Claims 1, 3-6 and 9-13 under 35 U.S.C. 102(b) as being anticipated by Divisek et al. (US 6,277,261 B1) is maintained. The rejection is repeated below for convenience.

With regard to Claim 1, Divisek et al. discloses a method of fabricating a membrane-electrode assembly (MEA), called an electrode-electrolyte unit, particularly for PEM fuel cells (column 4, lines 60-62), wherein the MEA comprises a polymer-electrolyte membrane (PEM) (1) having reaction layers (2) applied to both sides

(column 44-46) and gas diffusion layers (column 3, lines 43-44), wherein at least one of the reaction layers includes at least one catalytic component provided from a metal salt solution from which catalytically active metal can be extracted (column 2, lines 23-25) and an electron conductor, called an electrode (3,4) (column 3, lines 27-30), and wherein the method comprises the following steps:

A) introducing ions of the at least one catalytic component into the polymer-electrolyte membrane, catalytically active material is embedded in the solid material electrolyte (column 2, lines 31-33 and column3, lines 23-26),

B) applying the electron conductor, or electrodes (3,4) to both sides of the polymer-electrolyte membrane (1) (column 2, lines 61-64),

C) electrochemically depositing the ions of the catalytic component (column 4, lines 12-16), the electrochemical deposition being carried out under fuel cell conditions, where an electrochemically active three-phase boundary is present (column 3, lines 43-47), from the polymer-electrolyte membrane, introduced into the reaction layers, onto the electron conductor on at least one side of the polymer-electrolyte membrane (column 4, lines 47-52). The phrases "particularly for PEM fuel cells" and "optionally having gas diffusion layers" are given little to no patentable weight since the words "particularly" and "optionally" do not make these claim limitations a requirement.

With regard to Claim 3, Divisek et al. discloses wherein a variation of operating conditions, such as applying a current density and a voltage (column 4, lines 47-48), is effected during the deposition under fuel cell conditions.

With regard to Claims 4 and 5, Divisek et al. discloses wherein the electrochemical deposition of the ions of the catalytic component in step C) is carried out under electrolytic conditions, wherein the electrolytic conditions comprise the application of constant voltage of at least 1.23 V at room temperature or at a raised temperature (column 4, lines 47-52).

With regard to Claim 6, Divisek et al. discloses a method of fabricating a membrane-electrode assembly (MEA), called an electrode-electrolyte unit, particularly for PEM fuel cells (column 4, lines 60-62), wherein the MEA comprises a polymer-electrolyte membrane (PEM) (1) having reaction layers (2) applied to both sides (column 44-46) and having gas distribution layers (column 3, lines 43-44), wherein at least one of the reaction layers includes at least one catalytic component provided from a metal salt solution from which catalytically active metal can be extracted (column 2, lines 23-25) and an electron conductor, called an electrode (3,4) (column 3, lines 27-30), and wherein the method comprises the following steps:

A) introducing ions of the at least one catalytic component into the polymer-electrolyte membrane, catalytically active material is embedded in the solid material electrolyte (column 2, lines 31-33 and column3, lines 23-26),

B) applying the electron conductor, or electrodes (3,4) to both sides of the polymer-electrolyte membrane (1) (column 2, lines 61-64),

C) electrochemically depositing the ions of the catalytic component (column 4, lines 12-16), the electrochemical deposition being carried out under fuel cell conditions, where an electrochemically active three-phase boundary is present (column 3, lines 43-

47), from the polymer-electrolyte membrane, introduced into the reaction layers, onto the electron conductor on at least one side of the polymer-electrolyte membrane (column 4, lines 47-52), wherein in step C) at least one element from the 3rd to 14th group of the periodic table of the elements, specifically Pt, is deposited as the catalytic component onto the electron conductor on at least one side of the polymer-electrolyte membrane (column 4, lines 47-52). The phrases "particularly for PEM fuel cells" and "optionally having gas diffusion layers" are given little to no patentable weight since the words "particularly" and "optionally" do not make these claim limitations a requirement.

With regard to Claim 9, Divisek et al. discloses wherein the electron conductor comprises a flexible graphite mesh or a graphite paper with suitable electronic conductivity and suitable porosity for establishing electric contact (column 5, lines 14-16).

With regard to Claim 10, Divisek et al. discloses wherein the electron conductor applied in step B) comprises at least one catalytic component from the group consisting of Pt for both the anode and the cathode (column 4, lines 60-63).

With regard to Claim 11, Divisek et al. discloses wherein in step B), together with the electron conductor, an ion conductor is applied to at least one side of the polymer-electrolyte membrane, this being an ion conductive polymer that is part of the solution (2) that is a coating on the electrolyte layer (1) (column 3, lines 9-15 and column 4, lines 1-3).

With regard to Claim 12, Divisek et al. discloses wherein the catalytic component in step A) is introduced into the polymer-electrolyte membrane in an amount so selected that up to 0.01 to 1 mg metal per cm^2 can be deposited (column 2, lines 38-41).

With regard to Claim 13, Divisek et al. discloses a method of fabricating a membrane-electrode assembly (MEA), called an electrode-electrolyte unit, particularly for PEM fuel cells (column 4, lines 60-62), wherein the MEA comprises a polymer-electrolyte membrane (PEM) (1) having reaction layers (2) applied to both sides (column 44-46) and gas diffusion layers (column 3, lines 43-44), wherein at least one of the reaction layers includes at least one catalytic component provided from a metal salt solution from which catalytically active metal can be extracted (column 2, lines 23-25) and an electron conductor, called an electrode (3,4) (column 3, lines 27-30), and wherein the method comprises the following steps:

A) introducing ions of the at least one catalytic component into the polymer-electrolyte membrane, catalytically active material is embedded in the solid material electrolyte (column 2, lines 31-33 and column3, lines 23-26),

B) subsequently, applying the electron conductor, or electrodes (3,4) to both sides of the polymer-electrolyte membrane (1) (column 2, lines 61-64 and column 4, lines 1-6),

C) electrochemically depositing the ions of the catalytic component (column 4, lines 12-16), which, in step A), were introduced into the polymer electrolyte membrane, introduced into the reaction layers, the electrochemical deposition being carried out under fuel cell conditions, where an electrochemically active three-phase boundary is

present (column 3, lines 43-47), onto the electron conductor (column 4, lines 47-52). The phrases "particularly for PEM fuel cells" and "optionally having gas diffusion layers" are given little to no patentable weight since the words "particularly" and "optionally" do not make these claim limitations a requirement.

Claim Rejections - 35 USC § 103

5. The rejection of Claims 7 and 8 under 35 U.S.C. 103(a) as being unpatentable over Divisek et al. (US 6,277,261 B1), as applied to Claims 1, 3-6 and 9-13 above, is maintained. The rejection is repeated below for convenience.

Divisek et al. discloses in paragraph 4 above, the method of fabricating a membrane-electrode assembly (MEA), called an electrode-electrolyte unit, particularly for PEM fuel cells (column 4, lines 60-62), wherein the MEA comprises a polymer-electrolyte membrane (PEM) (1) having reaction layers (2) applied to both sides (column 44-46) and gas diffusion layers (column 3, lines 43-44), wherein at least one of the reaction layers includes at least one catalytic component provided from a metal salt solution from which catalytically active metal can be extracted (column 2, lines 23-25) and an electron conductor, called an electrode (3,4) (column 3, lines 27-30). Divisek et al. discloses wherein electrolysis is conducted until all the platinum is deposited on the porous electrically conductive layer, or the electrodes (column 4, lines 47-52). Divisek et al. discloses that one of the electrodes abuts the catalytic solution coating and the other electrode abuts the opposite side of the electrolyte layer (column 4, lines 4-6). Divisek et al. does not specifically disclose wherein the catalytic component is deposited

on the cathode-side electron conductor or on the anode-side electron conductor. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention and known in the art that the catalytic component would be present on either the cathode-side conductor or the anode-side conductor, after the electrochemical deposition occurs under fuel cell conditions, since the catalyst will pass through the electrolyte material onto the opposite side from which the catalyst is originally provided.

Response to Arguments

6. Applicant's arguments filed April 22, 2010, have been fully considered but they are not persuasive.

Applicant states that according to the present invention, a metal is deposited out of an ion-conductor, i.e., the membrane, itself. Applicant argues that, "this feature of the present invention provides an advantage over Divisek, because no opposite-ion, such as an anion, is present in the ion-conductor or bound to the ion-conductor, respectively."

According to the limitations of the claim, the ions present in the "ion-conductor", or membrane, are not required to be of a certain charge, for example, anions or cations. The claim limitations recite "electrochemically depositing the ions of the catalytic component...from the membrane and/or ionomer, onto the electron conductor on at least one side of the polymer electrolyte membrane". Divisek teaches the end of result of metal deposited out of the membrane onto the electron conductor on at least one side of the polymer electrolyte membrane. Therefore, even if the metal catalyst particles present in Divisek are of only one charge or the opposite charge, the metal

particles would move in one direction to be deposited onto "at least one side of the polymer membrane", which reads on the claim limitations.

Applicant argues that "foreign ions, as deposited according to Divisek, must be removed, typically by a washing process or the like. Additionally, this washing process occurs with chloride or perchlorate. Therefore, the washing tends to create further costs and operating steps."

The claim limitations are written with "comprising" language, which allows for the possibility of additional steps to take place within the claimed method steps. The end result of the method steps generates the same membrane electrode assembly as claimed. The additional steps of washing performed by Divisek do not exclude Divisek as being used as prior art against the instant invention. Applicant's argument that the additional step of washing would "tend to" create further costs and operating steps is not persuasive since it hasn't been proven that costs would go up if washing steps occurred and the claim language leaves open the possibility of a washing step.

Applicant finally argues that, "a distribution of the anions being dissolved from the membrane allows a rather homogeneous distribution and is being decelerated, at least to a certain extent, by diffusion. The homogeneous distribution of the anions causes the particles of the catalytic metal to be distributed very homogeneously and within a nm-range."

Applicant's argument is not persuasive. Homogenous distribution of ions is not recited in the claim limitations making the argument moot.

Conclusion

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karie O'Neill Apicella whose telephone number is (571) 272-8614. The examiner can normally be reached on Monday through Friday from 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PATRICK RYAN/
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KOA